Prevalence of headache in Kashmir Valley, India

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Abstract

Background: Headache disorders represent a major public health problem globally. It is more so in developing countries with rising trend in young adults affecting negatively their quality of life. There has been very little information on the epidemiology of headache disorder in Kashmir India which has witnessed prolonged and large scale militancy related disturbance. A prospective population based study was undertaken in Srinagar district of Kashmir to determine the prevalence of headache disorder. *Methods:* The study was a cross sectional survey using cluster sampling with a culturally adapted version of pretested questionnaire translated into local language, in Hazratbal Community Block of Srinagar. In the first phase households were screened. Individuals with headache were then examined by a senior neurologist for migraine and non migraine disorder. *Results:* The overall prevalence of headache was 66.2 % with female preponderance. Occurrence of headache was as high as 79.90 % in adults of 19-45 years. The prevalence rate declined after the age of 45 years in both the genders. Women had higher prevalence rate than men in all age groups and for all headache categories. Age distribution showed prevalence rate of migraine of 45.69% in young adults of 19-45 years; females 55.44% and males 32.79 %. Non migraine headache was more common than migraine type, and was more prevalent in young age group in both the genders, highest in adolescents (74.20 %). *Conclusion:* The high prevalence rate of headache both migrainous and non migrainous in Kashmir may be related to the stress the community has been subjected to from militancy related conflict since 1990.

INTRODUCTION

Headaches are among the most common neurological disorders prevalent in every country affecting both genders and all socioeconomic levels.[1-3] Besides impairing the routine activities of the affected people it sometimes manifests in loss of employment with attendant loss of family income. Recurrent headache is a risk factor for chronic headache and other pain syndromes. According to reports from Global Burden of Disease 2010, it may lead to medication overuse headache[4], besides being a major contributor to disability burden at individual level. Global Burden of Disease Study 2010[4] show that tension type headache and migraine are respectively the second and third most prevalent disease globally[4-6] and have been considered distinct entities by the International Headache Society.[7]

Rising issue of increasing headache during the last decade has been witnessed by many studies.[8,9] Most of the affected people practice self medication leading to inappropriate management and sometimes analgesic overuse causing treatment refractoriness.[10]

While knowledge gap across the world is slowly being filled by a series of population based studies with global campaign against headache with World Health Organisation[12-15], studies on prevalence of this disease have not been adequate in many developing countries.

Most of the studies on headache prevalence so far originate from high income countries of Western Europe and North America.[9] There are only a few studies from other areas including Africa and South Asian countries, reflecting considerable gaps in our knowledge of the burden of headache.[11] Majority of the information available is limited to hospital based studies / surveys which may not reflect the true dimensions of the disorders prevalent in a community. These reflect a highly selected, non representative and small proportion of the general population, with wide ranging estimates of headache from 0.2 % to 58 %.[16-19]

Kashmir valley is situated in North Western Himalayan region of India. It has been experiencing large scale political turbulence continuously since 1990. Continuous exposure to

militancy related conflicts may have resulted in stress with negative influence on socioeconomic conditions. There is no prevalence data of headache. Most of the information available is limited to hospital based reports. In one of such studies tension type headache and migraine in school going children in the Srinagar city has been reported to be 50.99 and 26.98 % respectively in school going children.[20] Earlier hospital based cross sectional study on the profile of various headache disorders[21] showed preponderance of tension type headache over migraine.

The aim of the present study was to determine the prevalence of headache in general population of Kashmir to facilitate planning and prioritising neurology care.

METHODS

Study area

Kashmir province in the northern most extremity of India with distinct temperate climate, is located between 20 and 36 degree N latitude with elevation ranging from 300 to 8400 m above sea level.[22] The population of the state is 10.25 million out of which 23.83 % is urban as compared to the national average of 25.72%.[25] This study was performed in the Hazratbal Community Block of District Srinagar with a population of about 150,000[25] distributed in nine zones. The area has both urban and rural population of varied socioeconomic conditions. The total area of the Block is 105 square kilometres. The study is a cross sectional survey using cluster sampling. It was undertaken in both urban and rural areas. The age group distribution was similar to that of Kashmir.

A team of trained personnel selected households in the study area through cluster sampling followed by simple random sampling. In each urban or rural area the interviewers randomly selected blocks or circumscribed collection of dwellings (clusters) and then one or more dwellings within each of these clusters was selected as sampling unit through simple randomization. All members of selected households were listed and one adult participant was selected within each household family as a key informant. Sampling was facilitated by the census data proving all socioeconomic and other relevant information. A household is defined as a group of persons generally relatives by blood, marriage and adoption who live in the same dwelling (housing unit) and share their incomes.

Verbal informed consent was obtained from the key informants before asking survey questions. The interviewer visited the study area on dates and timings mutually agreed to with the key informants of the selected dwellings. A total of 7,648 individuals was selected by random sampling. After excluding children less than 7 years of age, the net study population was 6,960. Institutional households such as paying guest accommodation, hostels, houseboats and hotels used for tourists were excluded. Security forces and those not conversant with local language were also excluded.

Screening instrument

The screening instrument for the survey was a culturally adapted version of the structured questionnaire developed for these surveys on the basis of International Headache Society and WHO protocol criteria[23] to determine the medical and demographic information for the diagnosis of headache disorders. The manual for descriptive studies for epidemiological studies in the developing countries[24] was the key resource document. The questionnaire was translated in local vernacular and then administered to local respondents. This instrument was pretested on 1,000 subjects for a period of four months before the actual data collection began. The sensitivity and specificity of the questionnaire was found to be 98 percent and 89% respectively.

General study design

The study was conducted under two phases. In the first phase, a sample of households was screened to identify the persons who possibly had a disorder of interest using the pre tested' questionnaire. For this phase population surveyed was put in eight age-determined sub groups ten years apart (Table 2). Individuals with migraine and non migraine headache were then examined by a senior neurologist in the second phase. The study population in the second phase was categorised in terms of age as, child/adolescent (7-18 years), young adults (19-45 years), middle age adults (46-65 years), and elderly senior citizens (> 65 years). Socioeconomic data of the study population in the second phase including the occupation and gender was also collected. The data was statistically analyzed using relevant software to work out Odds ratio. Prevalence rate and p values were' ascertained using -chi square test.

RESULTS

Population characteristics

The studied sample of 6,960 comprised of 3,602 (51.75%) males and 3,358 (48.25%) females. Most of the 1,806 (25.95%) subjects were in the age group of 10-19 years followed by 20-29 years age group with 1498 (21.52%) subjects. The difference in gender in all the age groups was not significant(p>0.05).

Age and sex distribution

Out of the total population of 6,960 screened in the first phase, 361 were found to have some possibility of neurological problem of interest (Table 3). Children/adolescents less than 19 years of age constituted 31% and elderly citizens above 60 years 9.21% of the total study population. The male female ratio was 1.07:1. The age gender distribution of the study population was similar to that of Kashmir.

The occupation and gender distribution of population of positive cases is shown in Table 4. The majority of the cases i.e. 64.8% or 234 subjects were un-skilled workers which also included students and the unemployed. As is shown in the Table 4, the prevalence rate of neurological problem of interest in unskilled study population was as high as 3362.07 per 100,000 as compared to semiskilled, skilled and professional which ranged between 143.68 to 919.54 per 100,000. The difference was statistically significant (p<0.05)

The overall prevalence of any headache (n =361) was 66.20 %. The prevalence of headache disorders in female population was 61.82 % compared to 38.18 % in males which was statistically significant (p <0.05). There was significant difference in age and prevalence of headache. The prevalence of headache disorders increased from children and adolescent to young adulthood. It was less in middle aged adult (19-45years), and was lower at 19 % in elderly (above 65 years). The prevalence of headache decreased after the age of 45 years in both the genders. (Table 5)

Migraine type headache was less prevalent than non migraine affecting 8.00 % of adolescents. However migraine prevalence peaked in both genders during the age group of 19-45 years with 45.69 % of population in this age group being affected. The prevalence in females was 55.44 % compared to 32.0 % in males. Migraine prevalence was lowest in the age group of 45-65 years at 26.41 %. None of the senior citizens in the study population had migraine.

Non migraine headache was the most common headache type in all the age groups of the study population affecting 73.59% of population age 19-45 years. (Table 5). Adolescents in the age group of 18 and below had the highest prevalence of non migraine headache (74.20 %). Migraine and non migraine headache showed significant difference between genders with overall more females compared to males suffering from these headaches.

DISCUSSION

The conduct of this study had various constraints due to limitations in healthcare infrastructure and personnel, and effects of militancy related conflicts since 1990. Studies undertaken earlier in Kashmir have been mostly clinic based, except a study based on school going children in 2012.[20]

The successful completion of this study in Hazratbal Community Block District Srinagar shows that a community survey for neurological disorders is feasible in the Kashmir valley. The sensitivity and specificity achieved by the study questionnaire are comparable to those from other studies that have used a similar protocol. It demonstrated that the strategy of evaluating subjects in their homes improved compliance.

The sex distribution of the subjects screened is similar to that in Kashmir. The population census from this study showed that the community is predominantly young with only 9% of population over the age of 60 years. The relatively young population in this community is similar to other parts of Kashmir and is common in many developing countries. This is in contrast with the industrialized countries where about 15% of population is above 60 years.[25-27] The population are predominantly unskilled occupational categories (65.6%), probably partly from the low literacy rates.

The overall prevalence of headache in the present studies was 66.2 % with female preponderance. Prevalence in the adult age group of 19-45 years was high at 79.90 % which was relatively high when compared to reports from elsewhere.[20,29] Globally 47 % of adults have been found to have headache.[1] Women had a higher prevalence than men in all age groups and for all headache categories in our studies. The female predominance found in the present studies is reported almost universally.[20,30-34] Another observation of this study was that prevalence of migraine and non migraine headaches peaked

Table 1: Response of study population to the questionnaire

Study population			Total number	Percent
Sample taken			7,648	6.80
Excluded (children < 7 years of age)			688	9.0
Net study population			6,960	91
Screened population	Phase – 1		381	5.47
	Phase – 2	Non responders	15	3.94
		Negative response	5	1.31
		Net positive	361	94.75

Table 2: Age and sex distribution of study population

Age (Years)	Male (%)	Female (%)	Total (%)
< 9	190 (5.27)	162 (4.83)	352 (5.06)
10 – 19	953 (26.46)	853 (25.45)	1806 (25.95)
20 – 29	791 (21.96)	707 (21.09)	1498 (21.52)
30 – 39	582 (16.16)	635 (18.94)	1217 (17.49)
40 – 49	460 (12.77)	425 (12.68)	885 (12.72)
50 – 59	292 (8.11)	269 (8.03)	561 (8.06)
60 – 69	198 (5.50)	182 (5.43)	380 (5.46)
> 70	136 (3.78)	125 (3.73)	261 (3.75)
TOTAL	**3602 (51.75)**	**3358 (48.25)**	**6960 (100)**

chi square = 9.705; p = 0.206 (Non-Significant)

Table 3: Age and sex distribution of the studied positive cases of our study

Age (Years)	Male (%)	Female (%)	Total (%)	Prevalence per 100,000
< 9	8 (4.7)	3 (1.6)	11 (3.0)	158.05
10 – 19	10 (5.9)	30 (15.6)	40 (11.1)	574.71
20 – 29	21 (12.4)	36 (18.8)	57 (15.8)	818.97
30 – 39	41 (24.3)	49 (25.5)	90 (24.9	1293.10
40 – 49	25 (14.8)	21 (10.9)	46 (12.7)	660.92
50 – 59	28 (16.6)	32 (16.7)	60 (16.6)	862.07
60 – 69	24 (14.2)	13 (6.8)	37 (10.2)	531.61
> 70	12 (7.1)	8 (4.2)	20 (5.5)	287.36
TOTAL	**169 (46.8)**	**192 (53.2)**	**361 (100)**	**5187.78**

chi square = 20.233; p = 0.005 (Significant)

Table 4: Occupation and gender of the subjects with neurological problem of interest

Occupation	Male (%)	Female (%)	Total (%)	Prevalence / 100,000
Un-skilled	77 (45.6)	157 (81.8)	234 (64.8)	3362.07
Semi-skilled	51 (30.2)	13 (6.8)	64 (17.7)	919.54
Skilled	34 (20.1)	19 (9.9)	53 (14.7)	761.49
Professional	7 (4.1)	3 (1.6)	10 (2.8)	143.68
TOTAL	**169 (100)**	**192 (100)**	**361 (100)**	**5186.78**

chi square = 54.514; p = < 0.05 (Significant)

Table 5: Prevalence of headache as per age and gender

Age	Gender	Headache			Result	
		Migraine (%)(n=91)	Non-Migraine (%) (n=148)	Total (%) (n=239)	*OR	p value
Children / Adolescent (≤ 18 years) (7-18 years)	Male	1 (14.28)	6 (85.72)	7 (41.2)	2.47	NS
	Female	7* (29.17)	17 (70.83)	24 (72.7)		
	Total	**8 (25.80)**	**23 (74.20)**	**31 (62.0)**		
Young adult (19-45 years)	Male	20 (32.79)	41 (67.21)	61 (70.9)	2.45	<0.05
	Female	49* (55.44)	41 (45.56)	90 (87.4)		
	Total	**69 (45.69)**	**82 (54.31)**	**151 (79.9)**		
Middle aged adult (46-65 years)	Male	5 (20.83)	19 (79.17)	24 (45.3)	1.71	NS
	Female	9* (31.03)	20 (68.97)	29 (60.4)		
	Total	**14 (26.41)**	**39 (73.59)**	**53 (52.5)**		
Elderly (senior citizens) (> 65 years)	Male	0 (0.0)	0 (0.0)	0 (0.0)	8.00	NS
	Female	0 (0.00)	4* (100.0)	4 (50.0)		
	Total	**0 (0.0)**	**4 (100.0)**	**4 (19.0)**		

NS = Non-Significant; OR = Odd's ratio; * = Odd's ratio calculated on that value
Age with regard to headache: chi square = 11.213; p = 0.011
Gender with regard to headache; Chi squire = 7.082; p = 0.069

in the fourth decade of life for both men and women. Prevalence declined after the age of 45 years in both the genders, a trend also observed in similar studies in Bangalore.[11] We also found headache to be highly prevalent especially in younger women. Similar observation has also been reported elsewhere.[30] The higher prevalence in females may be reflective of gender difference in healthcare seeking behaviour and stress.

The age distribution shows that migraine is more common in young adults. The prevalence of migraine was 45.69 % which was significantly higher (OR:2.45) in the group 19-45 years. There was an earlier study involving students to determine the prevalence rate of migraine in school children in Kashmir.[20] The prevalence rate of 45.69 % in almost similar age group is higher than previous report of 26.98%. The predominance of unskilled and unemployed in the studied population who are more susceptible to stress and the limited access to healthcare facilities may explain the variation in the two studies. Prevalence rate of migraine in our studies was significantly higher in females (p<0.05). The rate is also higher than that reported in epidemiological studies from elsewhere. Global Burden Study 2010 reported 14.70 % prevalence rate of migraine.[35] Some of the previous migraine prevalence reported include China 9.31 %[36], Russia 20.80[37], Karnataka India 25.2 %[32], and Northern India 13.44 %.[31] What accounts for such high prevalence of migraine in Kashmir in the study population is uncertain. Continuous exposure to militancy related conflicts resulting in stress, together with its negative influence on socio economic conditions may be contributing factors for such high incidence of the disorder.

Non migrainous headache especially tension type headache was more common than migraine in our study which is in concordance with the observations recorded in Norway.[30] This disorder showed no association except with age and was more prevalent in younger age group. Both genders of the study population were almost equally affected. Preponderance of migraine in females was recorded in Norway and North India.[30,31] It was more common in younger age group (adolescents) and middle age adults of the study population. It is difficult to explain this variation. However, our estimates of prevalence of non migrainous headache disorders are much higher than 20.10 % reported by Global Burden of Disease 2010.[4], and many others reported in other countries.[30] It is a stress related disorder and high prevalence in the present studies may

also have association with the prevailing military conflicts and other stressful situation in Kashmir.

In conclusion, this study has demonstrated a very high prevalence of headache disorders in Kashmir, a conflict zone in India. Both migraine and non migraine disorders show a very high prevalence with female preponderance in all age groups and socioeconomic levels of the population. It was more prevalent in younger women, peaking in the fourth decade of life

DISCLOSURE

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{WHO PROTOCOL EPIDEMIOLOGIC STUDIES OF NEUROLOGIC DISORDERS}

QUESTIONNAIRE
FOR SUBJECTS OF 7 YEARS OF AGE AND OLDER

Name (Sirname / First Name)..

Age (last completed year)...

98 = 98 years or more   99 = Unknown age

Sex
1 = Male   2 = Female

Religion
1 =   2 =   3 =   4 =   5 =   6 = Others

Past residence: Did you live in this area on
1 - No.   2 = Yes, all my life   3 = Yes, not all my life
4 = Don't know   5 = Didn't know

Occupation
1 = Preschool   2 = School   3 = House work
4 = Farm work   5 = Trading   6 = Artisan
7 = Teacher   8 = Farmer/Land owner   9 = Other
10 = Unknown

Relation to respondents
To be seen by the Neurologist
1 = Yes   2 = No

Date of Screening Examination

Q.I   Have you ever lost consciousness ?
| 1 = Yes | (more than once),   2 = Yes (once),   3 = Never
4 = Don't Know   5 = Didn't respond

Q.2   Have you ever had episodes where you lose contact with your surroundings ?
| 1 = Yes | 2 = Possible   3 = Never
4 = Don't know   5 = Didn't respond

Q.3   Have you ever had any shaking of your arms and legs which you could not control?
| 1 = Yes | 2 = No   3 - Don't know   4 = Didn't respond

Q.4   Is yours   Speech normal?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.5   Have Q.4 you had episodes of pain in the face?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.6   Has your face or part of your face ever been paralyzed for more than 24 hours?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.7   Have you ever had any weakness in your arms or legs for more than 24 hours?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.8   Have you ever been unable to walk properly?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.9   Have you ever had loss of sensation or abnormal sensation affecting your arms and legs lasting for more than 24 hours?
| 1 = Yes | 2 = No   3 = Don't know   4 = Didn't respond

Q.10   Have you ever suffered from headache?
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond

Q.11   Did you suffer from severe headaches, chiefly on one side of the head, which come on from time to time?
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond
5 = Not applicable

Q.12 **In association with these headaches do you suffer from visual disturbances, e.g., black spot or zig-zag lines in front of the eyes?**
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond
5 = Not applicable

Q.13 **In association with these headaches, do you suffer from nausea or vomiting?**
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond
5 = Not applicable

Q.14 **In association with these headaches, do you suffer from weakness or numbness in the limbs that lasts less than a few days?**
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond
5 = Not applicable

Q.15 **Do these headaches occur only when you have a febrile illness?**
1 = Yes   2 = No   3 = Don't know   4 = Didn't respond
5 = Not applicable

E1 **Hold both arms above head for 30 seconds**
1 = Both hands successful,   2 = Can't test : Why......
3 = Refused   4 = Does not understand,
5 = Rt. Hand- unsuccessful,   6 = Lt. hand unsuccessful
7 = Rt. and Lt, hand unsuccessful,

E2 **Pick up match stick from ground**
1 = Both hands successful,   2 = Can't test : Why......
3 = Refused   4 = Does not understand
5 = Rt. hand- unsuccessful,   6 = Lt. hand unsuccessful
7 = Rt. and Lt hand unsuccessful,

E3 **Close your eyes. Feel cloth sample. Is it: (1) smooth or (2) rough**
1 = Both hands successful,   2 = Can't test : Why......
3 = Refused   4 = Does not understand,
5 = Rt. hand- unsuccessful, 6 = Lt. hand unsuccessful
7 = Rt. and Lt hand unsuccessful,

E4 **Put your hands out in front of you. Close your eyes. Touch your nose with the right index. Repeat using left index finger**
1 = Both hands successful, 2 = Can't test: Why
3 = Refused   4 = Does not understand
5 = Rt. Hand poor control   6 = Lt. hand poor control
7 = Rt. And Lt. poor control

E5 **Walk heel to toe along the white line (2 meter cloth)**
1 = Successful,   2 = Can't test: Why
3 = Refused   4 = Does not understand
5 = Stands with difficulty   6 = Unsuccessful

E6 **Stand with both feet together**
1 = Successful,   2 = Can't test: Why
3 = Refused   4 = Does not understand
5 = Unsuccessful

E7 **Close your eyes and stand still for 15 sees. (Only if E6 answer is 1)**
1 = Successful,   2 = Can't test: Why
3 = Refused   4 = Does not understand
5 = Unsuccessful   6 = Not applicable

Date of Examination...

Physicians/Neurologists identification number...............................

☐ To be seen by Neurologist